

REMARKS

I. RESTRICTION REQUIREMENT

The action making the restriction requirement final and the withdrawal of the process claims 51 to 80 are acknowledged. However applicants might petition for withdrawal of the restriction requirement, if necessary.

In view of the above claim changes and these remarks it is respectfully submitted that the amended glass composition claims claim a glass composition that has common technical features that distinguish the claimed invention from the prior art. The main process claim 51 claims a process that makes a glass with the composition as defined in main glass composition claim 38 and thus include the common technical features that are in the glass composition claims.

As long as the amended independent composition claim 38 contains technical features that distinguish its subject matter from the prior art of record, especially Chu, et al, which was used to reject claim 38 as obvious under 35 U.S.C. 103 (a), then the restriction requirement should be withdrawn because then claims 38 and 51 comply with the requirements for unity of invention of PCT Rules 13.1 and 13.2. These requirements should be followed during the US National Stage.

Furthermore it is respectfully submitted that the effort or burden involved in examination of the composition and process claims in the same application is not excessive. Thus the process and composition claims should be prosecuted in the same application according M.P.E.P. 803.

II. INDEFINITENESS REJECTION

Claims 38, 39, and 42 to 49 were rejected under 35 U.S.C. 112, second paragraph, for indefiniteness.

Claims 39 and 48 have been canceled, obviating their rejections for indefiniteness.

The previously pending independent claim 38 claimed a glass composition containing at least 75 mol % of SiO_2 and at least 0.1 mol % of Yb_2O_3 . However claim 38 stated that the amount of ZrO_2 in the claimed glass composition was 0 to 40 mol %. The previously pending independent claim 38 was therefore indefinite because the maximum amount of ZrO_2 , which could be present in the glass composition, is only 24.9 mol %.

Accordingly claim 38 and the other newly amended independent claims have been amended to state that the maximum amount of ZrO_2 is 24.9 mol%.

There is no explicit disclosure in the specification of a glass composition that contains 24.9 mol % ZrO_2 or of an amount range for ZrO_2 with an upper limit of 24.9 mol %. However it is respectfully submitted that the amount range for ZrO_2 is not “new matter”.

The amount range for ZrO_2 disclosed in lines 2 to 3 of page 6 of applicants' specification is “up to 40 mol % ZrO_2 ”. This means that the glass composition can contain any amount up to 40 mol % and it would support an amount of 24.9 mol %. The originally disclosed concentration range for SiO_2 was 60 to 98 mol % of SiO_2 and the more limited amount range for SiO_2 is supported

by line 16 of claim 6.

However the upper limit of 24.9 mol % for ZrO_2 is not “new matter” because it amounts to “mere rephrasing” of the disclosure in accordance with M.P.E.P. 2163.07 I., regarding the upper limit of the concentration range for ZrO_2 , which is disclosed on page 6 of the specification.

Furthermore correction of obvious errors or clarifying changes in the claim wording, which would be obvious to one of ordinary skill from the explicit disclosures in the specification, are generally not considered to be new matter. See *Ex parte Brodbeck*, 198 USPQ 230 (Pat. Off. Bd. App. 1977); *In re Oda*, 170 USPQ 268 (C.C.P.A. 1971).

In accordance with the aforesaid legal principles it would be apparent to one of ordinary skill that a glass composition that contained a minimum of 75 mol % SiO_2 and a minimum of 0.1 mol % Yb_2O_3 would contain no more than 24.9 mol % of ZrO_2 , provided those ingredients were the only three ingredients of the glass composition. Thus one skilled in the art would interpret the 40 mol % upper limits for ZrO_2 and Yb_2O_3 as meaning that one could have the maximum amount of each of these ingredients permitted by the minimum amounts of the other ingredients present in the composition.

New claim 38 has been amended to define the glass composition with the narrow exclusionary “consisting of” wording so that the glass according to amended claim 38 is now limited to contain only the three ingredients, namely SiO_2 , ZrO_2 and Yb_2O_3 .

According to the same logic the disclosures on pages 5 and 6 of

applicants' originally filed specification support a conclusion that the maximum possible amount of Yb_2O_3 is 25 mol % because the minimum amount of SiO_2 in the amended claim 38 is 75 mol % and the minimum amount of ZrO_2 is 0 mol %.

The foregoing conclusions regarding the upper limits for ZrO_2 and Yb_2O_3 would be apparent to one of ordinary skill in the glass arts from the disclosures on pages 5 and 6 of the specification and thus should not be rejected as introducing "new matter".

The same logic was applied to the limits in amended claim 42; it is respectfully submitted that the upper limits of 24.9 mol % are not new matter.

For the above reasons and because of the changes in the upper limits for ZrO_2 and Yb_2O_3 , withdrawal of the rejection of claims 38, 42 to 47, and 49 as indefinite under 35 U.S.C. 112, second paragraph, for indefiniteness is respectfully requested.

III. OBVIOUSNESS REJECTION

1. Chu, et al

Claims 38 to 48 were rejected as obvious under 35 U.S.C. 103 (a) over the disclosures in US Patent 6,128,430, issued to Chu, et al.

Claims 39 and 48 have been canceled, obviating their rejections for indefiniteness.

The glass composition claims have been amended so that they now include independent claims that claim the applicants' compositions with "consisting of" wording. Thus they now exclude any ingredients that are not

recited in their claims.

Thus the rejection as obvious under 35 U.S.C. 103 (a) over Chu, et al, can no longer be based on overlapping concentration ranges. The most essential ingredient in the amplifier glass of Chu, et al, is erbium. Erbium is the ingredient that makes the glass function as an optical amplifier (column 1, lines 24 to 41). Accordingly the glass of Chu, et al, contains a required amount of Er_2O_3 (see claim 1, abstract, column 2, line 55, to column 3, line 24).

In contrast, Er_2O_3 is excluded from applicants' claims 38 and 40 to 47. Thus all the concentration ranges of the claimed compositions no longer overlap those of the glass composition disclosed in Chu, et al.

Furthermore Yb_2O_3 is a required ingredient in applicants' claimed compositions, but is only an optional ingredient in the glass compositions of Chu, et al. There is no Yb_2O_3 in any of the examples in Table I in columns 5 and 6 of Chu, et al. There are no other disclosures regarding the optional Yb_2O_3 in Chu, et al, but much disclosure regarding erbium-doped optical amplifier glass characteristics, such as gain and the like (see column 6, lines 31 and following, of Chu, et al).

In contrast to the implication on page 4 of the Office Action Yb_2O_3 and Er_2O_3 are not interchangeable. Er_2O_3 has different properties as a dopant for amplifier glass or for the core glass of an optical fiber and is employed in different applications than Yb_2O_3 . Chu, et al, require Er_2O_3 evidently because it is essential for their application while Yb_2O_3 is not.

Furthermore the amount ranges for SiO_2 of 75 to 98 mol %, of applicants'

claimed glass compositions are much narrower than the amount ranges according to the broad disclosures of Chu, et al, namely 0 to 90 mol %. The amount range for Yb₂O₃ of Chu, et al, is 0 to 5 mol %, whereas applicants' amount range is 0 to 25 mol %. The amount range for ZrO₂ is 0 to 24.9 mol % in the case of applicants' independent claims, but is 0 to 2 mol % in the case of Chu, et al.

According to the M.P.E.P. § 2144.05 overlapping concentration ranges provide a basis for a case of *prima facie* obviousness. However all concentration ranges of Chu, et al, no longer overlap those of the applicants' claimed glass composition, because of the exclusion of Er₂O₃ from the applicants' claimed glass compositions.

Furthermore M.P.E.P. § 2144.05 goes on to state that, if a prior art reference's disclosed concentration range for an ingredient is so broad as to encompass a very large number of possible distinct compositions, this might present a situation analogous to the obviousness of a species when the prior art broadly discloses a genus. See also *In re Baird*, 16 F.3d 380, 29 USPQ2nd 1550 (Fed. Cir. 1994); *In re Jones*, 958 F.2nd 347, 21 USPQ2nd 1941 (Fed. Cir. 1992); M.P.E.P. § 2144.08.

The applicants' claimed species of glass compositions with the narrow range for SiO₂ that requires amounts of SiO₂ of 75 mol % or more are not obvious from the glass composition disclosed in column 2 of Chu, et al, because the glass composition of column 2 of Chu, et al, encompasses many more embodiments that include glass compositions that are free of SiO₂ and have

small amounts of SiO₂ (and correspondingly much larger amounts of other oxide ingredients – up to 90 mol % or more of species other than SiO₂ and Er₂O₃).

A number of narrowly claimed glass compositions species are not *prima facie* obvious from a broad generic disclosure in the prior art, especially when the exemplary compositions of Chu, et al, in Table I lead away from including the required Yb₂O₃ in their glass compositions.

The only other glass composition mentioned in Chu, et al, is the cladding glass for their optical fiber. The cladding glass of column 3, lines 26 to 42, and claim 4 is not relevant to applicants' claimed glass and does not contain any Yb₂O₃ as either an optional or required ingredient. Also it does not contain any other heavy metal oxide or oxide of a metal having a high atomic number so that it could not be an X-ray opaque glass.

It is respectfully submitted that Chu, et al, do not provide sufficient disclosures that would lead one of ordinary skill in the art to the improved X-ray opaque glass compositions for dental applications, as they are now narrowly claimed in applicants' amended claims 38 and 40 to 47. Alternatively, even under the law based on the recent KSR decision sufficient reasons or explicit analysis must be provided under 35 U.S.C. 103 (a) if these claims continue to be rejected as obvious over Chu, et al (*Ex Parte Erkey, et al*, Appeal 20071375, Decided May 11, 2007). The obviousness rejection can no longer be based on the concept of overlapping concentration ranges, because the concentration ranges

no longer overlap. Also many of concentration ranges of Chu, et al, are quite different from the applicants' ranges and many of oxide ingredients of Chu, et al,

For the foregoing reasons withdrawal of the rejection of amended claims 38 and 40 to 47 as obvious under 35 U.S.C. 103 (a) over the disclosures in US Patent 6,128,430, issued to Chu, et al, is respectfully requested.

2. Chu, et al, in view of Kunert, et al

Claims 49 and 50 were rejected as obvious under 35 U.S.C. 103 (a) over the disclosures in US Patent 6,128,430, issued to Chu, et al, in view of US Patent 6,297,181, Kunert, et al.

Claim 49 has been amended so that it is now an independent claim. The glass composition of the amended claim 49 is the same as that of the amended claim 38, which **consists of** 75 to 98 mol % of SiO_2 , 0.1 to 25 mol % of Yb_2O_3 , and 0 to 24.9 mol % of ZrO_2 .

Kunert, et al, disclose an X-ray opaque dental glass composition. Column 7, lines 9 to 13, of Kunert, et al, does disclose grinding and sieving their glass compositions to obtain a glass particulate with a mean particle size that is comparable to that recited in claim 49. The disclosure in column 7, lines 24 to 28, is also noted.

However the foregoing features of claims 49 and 50 are not relied on to establish the patentability of the subject matter of claims 49 and 50. Instead the recited glass composition of claim 49 following "consisting of" is relied on to

establish patentability.

Chu, et al, do not establish a case of *prima facie* obviousness for the reasons recited above in part 1 of this section. First, Chu, et al, requires Er_2O_3 in their composition and the “consisting of” wording in claim 49 excludes this latter oxide ingredient. Next, Chu, et al, only teaches Yb_2O_3 as an optional ingredient with a 0 lower limit. Furthermore the examples of Chu, et al, would lead one skilled in the art away from including Yb_2O_3 , since they do not include this latter ingredient.

Kunert, et al, discloses and claims glass compositions that necessarily include oxide ingredients that are excluded by the “consisting of” wording in claim 49. These oxide ingredients and their minimum amounts are as follows: Al_2O_3 , 5 wt. %; Na_2O , 1 wt. %; ZnO , 2 wt. %; and F, 2 wt. %. All these ingredients are excluded by the wording of claim 49.

Thus Kunert, et al, cannot anticipate or be the basis for a case of *prima facie* obviousness of the amended independent claims 38 and/or 49.

It is respectfully submitted that a case of *prima facie* obviousness of the glass composition according to claims 49 and 50 cannot be established by Chu, et al, and Kunert, et al.

First one skilled in the glass arts would not combine the subject matter of Kunert, et al, with Chu, et al. These two references are from different fields of art as evidenced by their International and US Classification Numbers. Kunert, et al, discloses X-ray opaque dental glass and is thus from the field of materials for the dental arts, specifically cavity filling materials. Chu, et al, discloses optical

amplifier glass or core glass for optical fibers. Chu, et al, would never consult Kunert, et al, for improvements of the core glass or amplifier glass, which are optical glasses doped with erbium, since these fields are unrelated and have different requirements for their glass. Similarly Kunert, et al, would not consult Chu, et al.

Furthermore the disclosures of Chu, et al, are not reasonably pertinent to either the disclosures of Kunert, et al, or the applicants' claimed invention. The test for determining whether Kunert, et al, would be analogous art is as follows:

"whether the reference is still reasonably pertinent to the particular problem with which the inventor is involved." *In re Clay*, 23 U.S.P.Q. 2d 1058(Fed. Cir. 1992){underlining for emphasis is ours}.

It is respectfully submitted that Chu, et al, fails this test and cannot be combined with Kunert, et al, which is also teaches an X-ray opaque dental glass to reject the invention as claimed in claims 49 and 50. Chu, et al, is non-analogous art with respect to these claims.

Second even if one tries to combine Kunert, et al, with Chu, et al, despite the fact that they are not in a related field of art, it is unlikely that any explanation could be formulated to explain why one skilled in the art would eliminate the Er_2O_3 from the glass compositions of Chu, et al, because of disclosures made by Kunert, et al. Furthermore there would be no reason for not including ingredients that are required by Kunert, et al, and are excluded by the "consisting of" wording of claim 49.

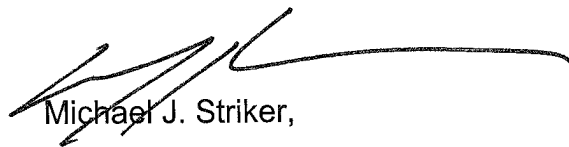
It is respectfully submitted that there is no reason in the prior art to combine the teachings of Chu, et al, and Kunert, et al, and even if such a combination is forced the result would not be the applicants' invention as claimed in claims 49 and 40.

For the foregoing reasons withdrawal of the rejection of amended claims 49 and 50 as obvious under 35 U.S.C. 103 (a) over the disclosures in US Patent 6,128,430, issued to Chu, et al, in view of US Patent 6,297,181, Kunert, et al, is respectfully requested.

Should the Examiner require or consider it advisable that the specification, claims and/or drawing be further amended or corrected in formal respects to put this case in condition for final allowance, then it is requested that such amendments or corrections be carried out by Examiner's Amendment and the case passed to issue. Alternatively, should the Examiner feel that a personal discussion might be helpful in advancing the case to allowance, he or she is invited to telephone the undersigned at 1-631-549 4700.

In view of the foregoing, favorable allowance is respectfully solicited.

Respectfully submitted,



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